



## Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

**“जानने का अधिकार, जीने का अधिकार”**

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

**“पुराने को छोड़ नये के तरफ”**

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 8291 (1976) : Phenthroate Emulsifiable Concentrates [FAD  
1: Pesticides and Pesticides Residue Analysis]

**“ज्ञान से एक नये भारत का निर्माण”**

Satyanaaranay Gangaram Pitroda

Invent a New India Using Knowledge



**“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”**

Bhartṛhari—Nītiśatakam

“Knowledge is such a treasure which cannot be stolen”





BLANK PAGE



PROTECTED BY COPYRIGHT

15 : 8291 - 1976

*Indian Standard*  
**SPECIFICATION FOR  
PHENTHOATE EMULSIFIABLE CONCENTRATES**

( First Reprint APRIL 1990 )

UDC 632.951 PHE

© Copyright 1977

BUREAU OF INDIAN STANDARDS  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002

Gr 2

April 1977

# Indian Standard

## SPECIFICATION FOR PHENTHOATE EMULSIFIABLE CONCENTRATES

Pest Control Sectional Committee, AFCDC 6

*Chairman*

Dr S. N. BANERJEE

*Representing*

Directorate of Plant Protection, Quarantine &  
Storage (Ministry of Agriculture & Irrigation),  
Faridabad

*Members*

Dr P. N. AGARWAL  
Dr N. P. RAO (*Alternate*)  
Dr H. L. BAMI

Ministry of Defence (R & D), New Delhi

Dr S. R. BAROOAH  
Dr N. K. BASU

Central Forensic Science Laboratory, Central  
Bureau of Investigation, New Delhi  
Pesticides Association of India, New Delhi  
The Alkali & Chemical Corporation of India  
Limited, Calcutta

Dr T. V. RAGHUBAMAN (*Alternate*)  
Shri P. CHAWLA

National Organic Chemical Industries Limited,  
Bombay

Shri K. D. AMRE (*Alternate I*)  
Shri BHUPINDER SINGH (*Alternate II*)  
Shri V. G. DESHPANDE

CIBA-Geigy of India Limited, Bombay

Shri E. A. ALMEIDA (*Alternate*)  
Shri O. P. DHAMIJA

Export Inspection Council of India, New Delhi

Shri P. K. CHATTERJEE (*Alternate*)  
Dr M. S. DHATT

National Malaria Eradication Programme, Delhi  
Department of Agriculture, Government of Uttar  
Pradesh, Lucknow

DIRECTOR OF AGRICULTURE

DEPUTY DIRECTOR (PLANT  
PROTECTION) (*Alternate*)

Food Corporation of India, New Delhi

Shri R. S. DIWEDI

Shri J. P. GUPTA (*Alternate*)

Indian Pharmacopoeia Committee (Ministry of  
Health & Family Planning), New Delhi

DRUGS CONTROLLER (INDIA)

Shri M. RAVI KANT (*Alternate*)

Forest Research Institute & Colleges, Dehra Dun  
Hindustan Insecticides Limited, New Delhi

FOREST ENTOMOLOGIST

Shri T. GEORGE JOHN

Dr S. N. NAG (*Alternate*)

Bombay Chemicals Private Ltd, Bombay

Shri G. D. GOKHALE

Shri V. V. KETKAR (*Alternate*)

(Continued on page 2)

© Copyright 1977

### BUREAU OF INDIAN STANDARDS

This publication is protected under the Indian Copyright Act (XIV of 1957) and reproduction in whole or in part by any means except with written permission of the publisher shall be deemed to be an infringement of copyright under the said Act.

(Continued from page 1)

<i>Members</i>	<i>Representing</i>
<b>SHERI PARTAM SINGH HOSHLARPURI</b>	Department of Agriculture, Government of Punjab, Chandigarh
<b>SHERI MUKHTIAR SINGH SRA</b> <i>(Alternate)</i>	
<b>JOINT DIRECTOR OF AGRICULTURE ( DEVELOPMENT &amp; ICP )</b>	Department of Agriculture, Government of Karnataka, Mysore
<b>DEPUTY DIRECTOR OF AGRICULTURE ( PLANT PROTECTION ) ( Alternate )</b>	
<b>DR R. L. KALRA</b> <b>DR R. P. CHAWLA ( Alternate )</b>	Punjab Agricultural University, Ludhiana
<b>DR KISHAN SINGH</b>	Indian Institute of Sugarcane Research ( ICAR ), Lucknow
<b>DR S. C. SRIVASTAVA ( Alternate )</b>	
<b>SHERI S. K. MAJUMDAR</b>	Central Food Technological Research Institute ( CSIR ), Mysore
<b>SHERI M. MUTHU ( Alternate )</b>	
<b>SHERI K. S. MEHTA</b>	Bharat Pulverising Mills Private Ltd, Bombay
<b>SHERI S. CHATTERJI ( Alternate )</b>	
<b>DR A. L. MOOKERJEE</b>	Cyanamid India Limited, Bombay
<b>SHERI J. P. PARIKH ( Alternate )</b>	
<b>DR S. K. MUKHERJEE</b>	Agricultural Chemicals Division, Indian Agri- cultural Research Institute ( ICAR ), New Delhi
<b>DR R. S. DEWAN ( Alternate )</b>	
<b>DR K. D. PAHARIA</b>	Central Insecticides Board, Directorate of Plant Protection, Quarantine & Storage ( Ministry of Agriculture & Irrigation ), Faridabad Bayer ( India ) Limited, Bombay
<b>DR S. Y. PANDIT</b>	
<b>SHERI D. N. NAKHATE ( Alternate )</b>	Regional Research Laboratory ( CSIR ), Hyderabad
<b>DR T. N. PARTHASARATHY</b>	Department of Agriculture, Government of Gujarat, Ahmadabad
<b>SHERI M. A. PATEL</b>	Rallis India Limited, Bombay
<b>SHERI Y. A. PRADHAN</b>	
<b>DR Z. J. KAPADIA ( Alternate )</b>	Tea Research Association, Calcutta
<b>DR F. RAHMAN</b>	
<b>DR G. SATYANARAYANA ( Alternate )</b>	Ministry of Defence ( DGI ), New Delhi
<b>SHERI G. K. RAO</b>	
<b>DR A. K. SEN ( Alternate )</b>	Pest Control ( India ) Private Ltd, Bombay
<b>DR H. N. MOHAN RAO</b>	
<b>SHERI MOHAN S. RAO ( Alternate )</b>	Entomology Division, Indian Agricultural Research Institute ( ICAR ), New Delhi
<b>DR RATTAN LAL</b>	Directorate General of Armed Forces Medical Services, Ministry of Defence, New Delhi
<b>MAJ-GEN D. C. SACHDEVA</b>	Department of Agriculture, Government of Andhra Pradesh, Hyderabad
<b>SHERI M. V. GOPALA KRISHNA SARMA</b>	
<b>SHERI P. SHANKAR RAO ( Alternate )</b>	Department of Agriculture, Government of Orissa, Bhubaneswar
<b>DR G. C. SENGUPTA</b>	
<b>SHERI J. M. SATPATHE ( Alternate )</b>	

(Continued on page 7)

(Continued from page 2)

*Members*

DR K. D. SHARMA

DR K. S. SINGH

SHEI S. C. SRIVASTAVA (*Alternate*)

DR K. SIVASANKARAN

DR K. N. SRIVASTAVA (*Alternate*)

DR B. L. WATTAL

SHEI T. PURNANANDAM,  
Deputy Director (Agri & Food)

*Representing*

Directorate General of Technical Development,  
New Delhi

Indian Veterinary Research Institute (ICAR),  
Izatnagar

Union Carbide India Limited, New Delhi

National Institute of Communicable Diseases,  
Delhi

Director General, ISI (*Ex-officio Member*)

*Secretary*

SHEI LAJINDEB SINGH

Assistant Director (Agri & Food), ISI

Pesticides Subcommittee, AFCDC 6 : 1

*Convenor*

DR K. D. PAHARIA

Central Insecticides Board, Directorate of Plant  
Protection, Quarantine & Storage (Ministry  
of Agriculture & Irrigation), Faridabad

*Members*

DR N. S. AGRAWAL

Department of Food (Ministry of Agriculture &  
Irrigation), New Delhi

DR K. KRISHNAMURTHY (*Alternate*)

CIBA-Geigy of India Limited, Bombay

SHEI E. A. ALMEIDA

DR R. J. KAMAT (*Alternate*)

Central Forensic Science Laboratory, Central  
Bureau of Investigation, New Delhi

DR H. L. BAMJI

Pesticides Association of India, New Delhi  
The Alkali & Chemical Corporation of India  
Limited, Calcutta

DR S. R. BABOOAH

National Organic Chemical Industries Limited,  
Bombay

DR N. K. BASU

DR A. P. DUTTA (*Alternate*)

SHEI P. CHAWLA

SHEI K. D. AMBEDKAR (*Alternate I*)

SHEI BHUPINDER SINGH (*Alternate II*)

SHEI K. K. CHHAYA

SHEI P. V. KAMGO (*Alternate*)

SHEI A. K. DAS

Excel Industries Limited, Bombay

DR K. D. SHARMA (*Alternate*)

Directorate General of Technical Development,  
New Delhi

DR M. S. DHATT

National Malaria Eradication Programme, Delhi  
Bombay Chemicals Private Ltd, Bombay

SHEI G. D. GOKHALE

SHEI V. V. KETKAB (*Alternate*)

(Continued on page 8)

(Continued from page 7)

*Members*

DR KALYAN SINGH  
 SHRI K. S. MEHTA  
 SHRI S. CHATTERJI (*Alternate*)  
 DR S. K. MUKHERJEE

DR R. S. DEWAN (*Alternate*)

DR S. N. NAG  
 SHRI A. N. NATAWAJAN (*Alternate*)  
 DR T. N. PABTHASABATHY

SHRI N. B. PATEL  
 SHRI D. N. V. RAO (*Alternate*)  
 SHRI S. L. PERTI  
 PLANT PROTECTION ADVISER TO  
 THE GOVERNMENT OF INDIA

DR V. LAKSHMINARAYANA (*Alternate*)

SHRI Y. A. PRADHAN  
 SHRI M. L. SHAH (*Alternate*)  
 DR V. S. RAMANATHAN

SHRI P. P. MATHEW (*Alternate*)

SHRI C. DHARMA RAO  
 SHRI G. K. RAO  
 DR A. K. SEN (*Alternate*)

DR H. N. MOHAN RAO  
 SHRI MOHAN S. RAO (*Alternate*)  
 DR K. K. SAXENA

SHRI S. S. SHAH  
 SHRI N. A. SHANBHAG (*Alternate*)  
 SHRI P. P. SINGHAL  
 SHRI MOHAMED YUSAF (*Alternate*)

SHRI N. S. VENKETARAMAN  
 DR B. L. WATTAL  
 SHRI V. N. BHATNAGAR (*Alternate*)

*Representing*

U. P. Institute of Agricultural Sciences, Kanpur  
 Bharat Pulverising Mills Private Ltd, Bombay

Agricultural Chemicals Division, Indian Agricultural Research Institute (ICAR), New Delhi

Hindustan Insecticides Limited, New Delhi

Regional Research Laboratory (CSIR), Hyderabad

Tata Chemicals Limited, Mithapur

Ministry of Defence (R & D), New Delhi

Directorate of Plant Protection, Quarantine & Storage (Ministry of Agriculture & Irrigation), Faridabad

Rallis India Limited, Bombay

Central Revenues Control Laboratory (Ministry of Finance), New Delhi

Pesticides Testing Laboratory, Hyderabad

Ministry of Defence (DGI), New Delhi

Pest Control (India) Private Ltd, Bombay

Indofil Chemicals Limited, Bombay

New Chemi Industries Private Limited, Bombay

Pesticides India, Udaipur

Pesticides Testing Laboratory, Madurai

National Institute of Communicable Diseases, Delhi

AMENDMENT NO. 1 JUNE 1988  
TO  
**IS:8291-1976 SPECIFICATION FOR PHENTHOATE  
EMULSIFIABLE CONCENTRATES**

(*Page 4, clause 2.2.5*) - Add the following Note  
at the end of the clause:

'Note - The material need not be subjected to heat treatment if it has crossed half of its shelf life as ascertained from the date of manufacture and date of expiry declared on the container.'

(AFCDC 6)

---

Reprography Unit, BIS, New Delhi, India

**AMENDMENT NO. 2 MAY 1994**  
**TO**  
**IS 8291 : 1976 SPECIFICATION FOR PHENTHOATE EC**

*(Page 4, clause 2.2.5) — Delete.*

*(Page 6, clause 4.1) — Substitute the following for the existing:*

'When freshly manufactured material in bulk quantity is offered for inspection, representative samples of the material shall be drawn and tested as prescribed in IS 10627 : 1983 within 90 days of its manufacture. When the material is offered for inspection after 90 days of its manufacture, sampling shall be done as prescribed in IS 10627 : 1983. However, the criteria for conformity of the material when tested, shall be the limits of tolerances, as applicable over the declared nominal value and given under clause 2.3.1 of the standard.'

# *Indian Standard*

## SPECIFICATION FOR PHENTHOATE EMULSIFIABLE CONCENTRATES

### 0. FOREWORD

**0.1** This Indian Standard was adopted by the Indian Standards Institution on 31 December 1976, after the draft finalized by the Pest Control Sectional Committee had been approved by the Agricultural and Food Products Division Council and the Chemical Division Council.

**0.2** Phenthroate emulsifiable concentrates are largely used in the control of insect pests of agricultural importance. This standard has been prepared to facilitate the supply of phenthroate emulsifiable concentrates of a quality suitable for use under subtropical and tropical conditions.

**0.3** Phenthroate emulsifiable concentrate is generally manufactured to contain 50 percent ( m/m ) of phenthroate.

**0.4** In the preparation of this standard, due consideration has been given to the provisions of the Insecticides Act, 1968 and the Rules framed thereunder. However, this standard is subject to the restrictions imposed under these, wherever applicable.

**0.5** For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960\*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

---

### **1. SCOPE**

**1.1** This standard prescribes the requirements and the methods of sampling and test for phenthroate emulsifiable concentrates.

### **2. REQUIREMENTS**

**2.1 Constituents** — The material shall consist of phenthroate, technical, dissolved in suitable solvent(s), together with emulsifying agent(s), and with or without stabilizer(s).

---

\*Rules for rounding off numerical values ( revised ).

**2.1.1 Phenthoate, technical, employed in the manufacture of this material shall conform to IS : 8293-1976\*.**

**2.2 Physical** — The material shall comply with the following physical requirements.

**2.2.1 Description** — The material shall be in the form of clear, stable and homogeneous liquid, free from foreign matter.

**2.2.2 Cold Test** — No turbidity or separation of solid and/or oily matter shall occur when the material is subjected to the cold test at 10°C as prescribed in 13.1 of IS : 6940-1973† or any other lower temperature as agreed to between the purchaser and the vendor. For the purpose of this test, introduction of seeding crystal is not necessary.

**2.2.3 Flash Point ( Abel )** — When determined by the method prescribed in IS : 1448 [ P : 20 ]-1960‡, the flash point of the material shall be above 24.5°C.

**2.2.4 Emulsion Stability** — The creaming or the sediment, if any, shall not in either case exceed 2.0 ml at the top or bottom of the 100-ml cylinder, when tested by one of the methods prescribed in 13.3 of IS : 6940-1973†. There shall also be no oil separation.

**2.2.5 Heat Stability** — After treating in accordance with the method prescribed in 13.4 of IS : 6940-1973† the material shall comply with the requirements of 2.2.1 to 2.2.4 and 2.3.1.

**2.3 Chemical** — The material shall comply with the chemical requirements given in 2.3.1, 2.3.1.1 and 2.3.2.

**2.3.1 Phenthoate Content** — When determined by the method prescribed in Appendix A of IS : 8293-1976\*, the observed phenthoate content, percent mass/mass of any of the samples shall not differ from the nominal value by more than the appropriate percent tolerance as follows:

<i>Nominal Value, Percent</i>	<i>Tolerance, Percent</i>
Up to 9	+ 10 - 5
10 and below 50	± 5
50 and above	+ 5 - 3

} Of the nominal value

\*Specification for phenthoate, technical.

†Method of tests for pesticides and their formulations.

‡Methods of test for petroleum and its products, P : 20 Flash point by Abels apparatus.

**2.3.1.1** The actual value of the phentoate content in the formulation shall be calculated to two decimal places for rounding off to one decimal place before applying the tolerances given in 2.3.1.

**2.3.2 Acidity or Alkalinity** — When determined by the method prescribed in 11.3 of IS : 6940-1973\*, the acidity ( as  $H_2SO_4$  ) shall be not more than 0·5 percent by mass; and alkalinity ( as NaOH ) shall not exceed 0·1 percent by mass.

### 3. PACKING AND MARKING

**3.1 Packing** — The material shall be packed in clean and dry containers made of mild steel or tinplate properly and suitably lacquered from inside. Aluminium containers may also be used. The containers shall also comply with the general requirements as stipulated in 2 of IS : 8190 ( Part II )-1976†.

**3.1.1** Retail pack of one litre shall be individually placed in transparent polyethylene bags of minimum thickness of 0·125 mm which shall be closed by heat sealing and shall contain adequate space to collect leaking material, if any.

**3.2 Marking** — The containers shall bear legibly and indelibly the following information in addition to the information as is necessary under the Insecticides Act and Rules:

- a) Name of the material;
- b) Name of the manufacturer;
- c) Date of manufacture;
- d) Batch number;
- e) Net volume of contents;
- f) Nominal phentoate content, percent mass/mass; and
- g) The minimum cautionary notice worded as follows:

'POISONOUS. HANDLE WITH CARE. KEEP MATERI...  
OUT OF REACH OF CHILDREN AND WELL AWAY FROM  
FOODSTUFFS, ANIMAL FEEDS, AND THEIR CONTAINERS.  
AVOID SKIN CONTACT. WHILE HANDLING WEAR PRO-  
TECTIVE GLOVES AND CLEAN PROTECTIVE CLOTHING.  
IN CASE OF POISONING CALL THE PHYSICIAN. SPECIFIC  
ANTIDOTES — ATROPINE AND PRALIDOXIME.'

**3.2.1** In addition to the above, the container shall also be marked with symbol for danger of poisoning as specified in IS : 1260 ( Part I )-1973‡.

\*Method of tests for pesticides and their formulations.

†Requirements for packing of pesticides: Part II Liquid pesticides.

‡Pictorial markings for handling and labelling of goods: Part I Dangerous goods (first revision).

### 3.2.2 The containers may also be marked with the ISI Certification Mark.

**NOTE** — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

## 4. SAMPLING

### 4.1 Representative samples of the material shall be drawn as prescribed in 'Indian Standard method for sampling of pesticides and their formulations (*under preparation*)'.

**NOTE** — Till such time the standard under preparation is published, the matter shall be as agreed to between the parties concerned.

## 5. TESTS

### 5.1 Tests shall be carried out as prescribed in 2.2.2 to 2.2.5, 2.3.1 and 2.3.2.

### 5.2 Quality of Reagents — Unless specified otherwise, pure chemicals and distilled water (*see IS : 1070-1960\**) shall be employed in tests.

**NOTE** — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

---

\*Specification for water, distilled quality (*revised*).

# BUREAU OF INDIAN STANDARDS

## Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002

Telephones: 331 01 31, 331 13 75

Telegrams: Manaksantha  
( Common to all Offices )

## Regional Offices:

	Telephone
Central Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002	{ 331 01 31 331 13 75
*Eastern : 1/14 C. I. T. Scheme VII M. V. I. P. Road, Maniktola, CALCUTTA 700054	36 24 99
Northern : SCO 445-446, Sector 35-C, CHANDIGARH 160036	{ 2 18 43 3 16 41
Southern : C. I. T. Campus, MADRAS 600113	{ 41 24 42 41 25 19 41 29 16
†Western : Manakalaya, E9 MIDC, Marol, Andheri ( East ), BOMBAY 400093	{ 2 63 48 2 63 49

## Branch Offices:

'Pushpak', Nurmohammed Shaikh Marg, Khanpur, AHMADABAD 380001	{ 2 63 48 2 63 49
‡Peenya Industrial Area 1st Stage, Bangalore Tumkur Road BANGALORE 560058	{ 38 49 55 38 49 56
Gangotri Complex, 5th Floor, Bhadbhada Road, T. T. Nagar, BHOPAL 462003	6 67 16
Plot No. 82/83, Lewis Road, BHUBANESHWAR 751002	5 36 27
53/5, Ward No 29, R.G. Barua Road, 5th Byelane, GUWAHATI 781003	3 31 77
5-8-56C L. N. Gupta Marg ( Nampally Station Road ). HYDERABAD 500001	23 10 83
R14 Yudhister Marg, C Scheme, JAIPUR 302005	{ 6 34 71 6 98 32
117/418 B Sarvodaya Nagar, KANPUR 208005	{ 21 68 76 21 82 92
Patliputra Industrial Estate, PATNA 800013	6 23 05
T.C. No. 14/1421, University P.O., Palayam TRIVANDRUM 695035	{ 6 21 04 6 21 17

## Inspection Offices ( With Sale Point ):

Pushpanjali, First Floor, 205-A West High Court Road, Shankar Nagar Square, NAGPUR 440010	2 51 71
Institution of Engineers ( India ) Building, 1332 Shivaji Nagar, PUNE 411005	5 24 35

↳ Sales Office in Calcutta is at 5 Chawringhee Approach, P. O. Princep 27 68 00  
Street, Calcutta 700072

↳ Sales Office in Bombay is at Novelty Chambers, Grant Road, 29 65 28  
Bombay 400007

↳ Sales Office in Bangalore is at Unity Building, Narasimhares Square, 22 36 71  
Bangalore 560002